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longitudinal direction of the article, however not fixed thereon at the intermediate part.

It is preferable that the surface sheet is shorter than the top sheet at the longitudinal direction of the article when it is not used.

It is also preferable that the surface sheet has the central part which may fall downwardly of the peripheral part when it has a weight of 40 grams on the central part.

It is preferred that at least the peripheral part of the surface sheet comprises an elastic material. The surface sheet may be composed totally of an elastic material. Alternatively it may have an elastic member such as an elastic strip, in particular on the side ends thereof.

It is preferable that the peripheral part of the surface sheet is provided to be upper than the peripheral part of the article when it is not used.

The surface sheet may be made of a liquid-impermeable material such as nonwoven fabric, film and net.

The absorber may consist of flap pulp which preferably contain a superabsorbent polymer such as starch, cellulose, synthetic polymers, a graft-copolymer of starch and acrylic acid or a salt thereof, a saponified product of a graft copolymer of starch and acrylonitrile, a crosslinked product of sodium carboxymethylcellulose and a polymer of acrylic acid or a salt thereof, which can afford absorption of liquid 20 times or more as much as its weight, getting gel.

The top sheet may be composed of nonwoven fabrics, film or net, being liquid-permeable. It preferably is water-repellent at its peripheral part and permeable at the central part.

The back sheet is preferably composed of a low density polyethylene sheet having a thickness of 10 to 60 microns, more preferably being porous to allow much humidity to go out.

The elastic member may be composed of polyurethane, natural rubber or fibers which are shrinkable when they are wet with water.

The absorbing article of the present invention is constructed such that the liquid-permeable upper sheet is placed on the top sheet above the absorber, with its both ends in the lengthwise direction fixed to the absorber, or the liquid-permeable top sheet, or the liquid-impermeable back sheet, and its intermediate part unfixed over its entire width. Therefore, the intermediate part of the liquid-permeable upper sheet easily comes into close contact with the wearer's crotch without being affected by the deformation of the absorber.

The absorbing article of the present invention denotes a disposable diaper or the like to absorb excreta. In this invention, the absorbing article is not limited to the diaper which is worn by babies and incontinent patients; but it may also be applied to briefs for incontinent patients.

The absorbing article of the present invention effectively absorbs the wearer's excreta (urine and feces) and prevents their leakage, because it is constructed such that the intermediate part of the liquid-permeable upper sheet is not fixed to the absorber and hence it comes into close contact with the wearer without being affected by the deformation of the absorber.

The absorbing article of the present invention absorbs the wearer's excreta in the following manner. Excreta are received by the intermediate part of the liquid-permeable upper sheet and then absorbed by the absorber. The intermediate part of the liquid-permeable upper sheet comes into close contact with the wearer's crotch when the diaper is worn, so that it receives the wearer's excreta almost completely without leakage and introduces them to the center of the absorber, permitting the absorber to fully exhibit its absorbing performance.

The free intermediate part of the liquid-permeable upper sheet works in concert with the absorber in the following manner. Since the absorber is under the intermediate part of the liquid-permeable upper sheet, it absorbs the excreta received by the intermediate part of the liquid-permeable upper sheet. In some embodiments, the intermediate part of the liquid-permeable upper sheet comes into contact with the top sheet, so that the excreta received by the intermediate part are rapidly introduced to the absorber via contact points.

The important effect of the present invention is the ability of the diaper to receive the wearer's excreta almost completely without leakage and to introduce them to the center of the absorber, thereby making full use of the absorbing performance, which is attributed to the fact that the liquid-permeable upper sheet has the intermediate part which almost independently comes into close contact with the wearer's crotch. In addition, the diaper of the present invention can hold solid excreta such as feces without leakage. Another effect of the present invention is the ability of the liquid-permeable upper sheet to be easily removed from the diaper proper so that it can be discarded together with excreta, which is attributed to the fact that the liquid-permeable upper sheet is fixed at their ends with a limited amount of fixing force.

The absorber 14 is usually a pad of crushed softwood kraft pulp covered by water-absorbing paper. It should preferably contain a polymeric absorber. The pad usually weighs about 10 g to 40 g.

The liquid-permeable upper sheet 15 is placed on the top sheet 12. It is fixed to the above-mentioned top sheet 12 at both ends 25 and 26 of the diaper in its lengthwise direction, with its intermediate free part 27 unfixed. The width of the upper sheet 15 should preferably be about 30% to about 70% of the width of the diaper 11. Especially, it should be narrower than the minimum width of the crotch section 22 of the absorber 14. This makes better use of the absorber 14. The length of the upper sheet 15 may not equal that of the diaper 11 but should preferably be shorter substantially. The flat shape of the upper sheet 15 should preferably be such that the width of the free part 27 is narrow and the width of the ends 25 and 26 is wide so that the upper sheet 15 comes into close contact with the wearer's crotch. However, there could be an instance where the free part 26 is as wide as or wider than the ends 25 and 26. The upper sheet 15 may be made of a nonwoven fabric, reticulated sheet, porous sheet, or elastic sheet which is permeable to liquids.

When worn, the diaper has a shape as shown in Fig. 2 which is a sectional view taken along the line A-A of Fig. 1. The liquid-permeable upper sheet 15 is fixed to the liquid-permeable top sheet 12 by the fixing means 28 and 29 at the ends 25 and 26, but the free part 27 is not fixed. The length of the free part 27 should preferably be substantially shorter than the distance between the inner ends of the fixing means 28 and 29 when the diaper is stretched flat. With these dimensions, the free part 27 separates from the absorber 14, as shown in Fig. 2. The fixing means 28 and 29 should be at two positions in the lengthwise direction of the diaper 11 and they should also be at the position where the free part 27 exists. The preferred position is within the range of about 10 mm to about 50 mm from the front and rear ends in the lengthwise direction of the diaper 11. The width of the fixing means 28 and 29 should preferably be close to the front width of the upper sheet 15. The area of the fixing means 28 and 29 is not specifically limited. The peel strength of the top sheet 12 and upper sheet 15 at the fixing means 28 and 29 should be such that the upper sheet 15 does not peel off while the diaper is worn but can be peeled off without any loss of strength when it is to be peeled off for the disposition of excreta. The specific fixing means 28 and 29 include hot-melt bonding, heat bonding, ultrasonic bonding, sewing, and hook-loop combination.

In the embodiment shown in Figs. 1 and 2, the liquid-permeable upper sheet 15 is placed on the liquid-permeable top sheet 12 and the top sheet 12 is arranged all over the diaper 11. However, it is not necessary that the top sheet 12 should exist under the entire area of the upper sheet 15. In this case, the fixing means 28 and 29 of the upper sheet 15 are partly tied up with the back sheet.

Comparative Example 1.

A disposable diaper used here consists of a liquid-permeable top sheet, a liquid-impermeable back sheet, and an absorber.

Example 2

A diaper used here is the same diaper as used in Comparative Example 1 except further comprising a surface sheet composed of hydrophilic nonwoven fabric produced by melting polyolefine fiber.

Example 3

The same diaper as used in Comparative Example 1 further comprises a surface sheet of nonwoven fabric of rayon produced by water-needling.

Example 4

The same diaper as used in Comparative Example 1 further comprises a surface sheet composed of a polyolefine net.

Comparative Example 2

The same diaper as used in Comparative Example 1 further comprises a surface sheet of hard dury polyvinyl chloride having perforates of 5 mm diameter at intervals of 10 mm.

5. The article as claimed in anyone of the preceding claims wherein the peripheral part of the surface sheet (15) is provided to be upper than the peripheral part of the article when the same is not in use.

Patentansprüche

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1. Ein saugfähiger Gegenstand mit einer flüssigkeitsundurchlässigen Rückschicht (13), einer flüssigkeitsdurchlässigen Oberschicht (12), einem saugfähigen Stoff (14), der zwischen der Rückschicht (13) und der Oberschicht (12) angeordnet ist sowie einer flüssigkeitsdurchlässigen Oberflächenschicht (15), die auf der Oberschicht (12) befestigt ist,

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dadurch gekennzeichnet,

daß die Oberflächenschicht (15) an der Oberschicht (12) nur an ihren beiden Enden in Längsrichtung befestigt ist, jedoch nicht befestigt ist in dem mittleren Teil, wobei die Oberflächenschicht (15) kürzer ist als die Oberschicht (12) in Längsrichtung des Gegenstandes, wenn dieser nicht in Benutzung ist.

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2. Gegenstand nach Anspruch 1, mit

$$0,3L_2 \leq L_1 \leq 0,98 L_2,$$

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wobei L_1 die Länge in Längsrichtung der Oberflächenschicht (15) ist und L_2 die Länge der Oberschicht in Längsrichtung.

3. Gegenstand nach Anspruch 1, mit

$$0,5L_2 \leq L_1 \leq 0,90 L_2,$$

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wobei L_1 die Länge in Längsrichtung der Oberflächenschicht (15) ist und L_2 die Länge der Oberschicht in Längsrichtung.

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4. Gegenstand nach einem der vorangehenden Ansprüche, bei welchem der periphere Teil der Oberflächenschicht (15) ein elastisches Material umfaßt.

5. Gegenstand nach irgendeinem der vorangehenden Ansprüche, wobei der periphere Teil der Oberflächenschicht (15) höher angeordnet ist, als der periphere Teil des Gegenstandes, wenn dieser nicht in Benutzung ist.

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Revendications

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1. Article absorbant comprenant une feuille (13) de support imperméable aux liquides, une feuille supérieure (12) perméable aux liquides, un absorbant (14) placé entre la feuille de support (13) et la feuille supérieure (12), et une feuille (15) de surface perméable aux liquides, fixée sur la feuille supérieure (12), caractérisé en ce que la feuille (15) de surface est fixée à la feuille supérieure (12) uniquement à ses deux extrémités dans la direction longitudinale, mais ne lui est pas fixée dans la partie intermédiaire, la feuille de surface (15) étant plus courte que la feuille supérieure (12) dans la direction longitudinale de l'article lorsque celui-ci n'est pas utilisé.

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2. Article selon la revendication 1, dans lequel :

$$0,3 L_2 \leq L_1 \leq 0,98 L_2$$

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L_1 étant la longueur, en direction longitudinale, de la feuille (15) de surface et L_2 étant la longueur, dans la direction longitudinale, de la feuille supérieure.

3. Article selon la revendication 1, dans lequel :

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$$0,5 L_2 \leq L_1 \leq 0,90 L_2$$

L_1 étant la longueur, dans la direction longitudinale, de la feuille (15) de surface et L_2 étant la longueur, dans la direction longitudinale, de la feuille supérieure.

